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Health Benefits of Smoking Cessation

This issue of MMWR *focuses on the adverse effects of tobacco use on the public's health and on efforts to reduce and prevent those effects.*

On September 25, 1990, The Health Benefits of Smoking Cessation: A Report of the Surgeon General, 1990, *was released. The major conclusions of the report are: 1) smoking cessation has major and immediate health benefits for persons of all ages and provides benefits for persons with and without smoking-related disease; 2) former smokers live longer than continuing smokers; 3) smoking cessation decreases the risk for lung and other cancers, heart attack, stroke, and chronic lung disease; 4) women who stop smoking before pregnancy or during the first 3 to 4 months of pregnancy reduce their risk for having a low–birth-weight infant to that of women who never smoked; and 5) the health benefits of smoking cessation substantially exceed any risks from the average 5-lb (2.3-kg) weight gain or any adverse psychologic effects that may follow quitting.*

An executive summary of the report will be published as an MMWR Recommendations and Reports *on October 5, 1990. Additional information is available from the Public Information Branch, Office on Smoking and Health, Center for Chronic Disease Prevention and Health Promotion, CDC, at (301) 443-5287.*

Perspectives in Disease Prevention and Health Promotion

Smokers' Beliefs about the Health Benefits of Smoking Cessation — 20 U.S. Communities, 1989

The health risks associated with smoking and the reduction in risk associated with smoking cessation are well documented (*1,2*). Although public knowledge of the health hazards of smoking is high and has increased steadily since the 1950s (*1*), data are limited regarding public knowledge of the health benefits of smoking cessation. This report presents data on smokers' beliefs about their chances of avoiding disease by quitting smoking.

Smokers' Beliefs — Continued

Data were obtained from a telephone survey conducted from January through April 1989 of a random sample of 4351 smokers aged 25–64 years. The survey was conducted in 20 communities* in the United States as part of the National Cancer Institute's Community Intervention Trial for Smoking Cessation (*3*). Interviews were completed with 3669 (84%) eligible smokers regarding their knowledge, attitudes, and behavior relevant to cigarette smoking. For this report, responses to two items were analyzed: 1) "How likely do you think it is that you will avoid or decrease serious health problems from smoking if you quit?" (four response choices ranged from "very likely" to "very unlikely"); and 2) "If a person has smoked for more than 20 years, there is little health benefit to quitting" (four response choices ranged from "strongly agree" to "strongly disagree"). Responses were examined in relation to sex, age, level of education (high school graduate or less vs. some college or more), and daily cigarette consumption (<25 or ≥25 cigarettes per day).

Overall, 83% of smokers responded that it was "very likely" or "likely" that by quitting they would avoid or decrease serious health problems from smoking. Eighty-five percent of smokers disagreed that little health benefit exists from quitting for a person who has smoked >20 years. For both items, beliefs about the benefits of quitting varied by age and education but not by sex. Within each age group, respondents who had attended college were more likely to both perceive benefits and disagree that there is little benefit from quitting than were those who had not ($p<0.05$, chi-square test) (Figure 1); this difference increased with age. For smokers with no college education, 87% of those aged 25–34 years and 67% of those aged 55–64 years believed they would avoid or decrease serious health problems by quitting ($p<0.05$). For college-educated smokers, age group differences did not vary significantly (Figure 1).

Reported by: KM Cummings, PhD, R Sciandra, Dept of Cancer Control and Epidemiology, Roswell Park Cancer Institute, Buffalo, New York, and TF Pechacek, PhD, WR Lynn, National Cancer Institute, National Institutes of Health, for the Community Intervention Trial for Smoking Cessation Research Group. Office on Smoking and Health, Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: Former smokers most frequently cite concern about health as the reason for quitting smoking (*4*). Although most of the public is aware of the health risks associated with smoking and the health benefits of smoking cessation, smokers tend to be less aware of these risks and benefits, and sizable gaps in public knowledge persist in certain sociodemographic groups.

Educational level appears to be the best sociodemographic predictor of smoking behavior. Cessation rates are higher for college-educated than for noncollege-educated groups, a disparity that appears to be increasing (*1,5*). Educational status may be linked to attitudes and values that predispose a person to accept or reject warnings about tobacco use and may reflect exposure to antismoking messages (*6*). Future antismoking campaigns need to be more sensitive to educational status when defining messages and selecting communication channels.

Knowledge of the benefits of smoking cessation was lowest in smokers aged 55–64 years who had no college education. Thus, greater attention must be directed at informing this group about the health benefits of quitting smoking.

*Bellingham and Longview/Kelso, Washington; Albany/Corvallis and Medford/Ashland, Oregon; Vallejo and Hayward, California; Santa Fe and Las Cruces, New Mexico; Cedar Rapids and Davenport, Iowa; Raleigh and Greensboro, North Carolina; Paterson and Trenton, New Jersey; Yonkers, New Rochelle, Utica, and Binghamton/Johnson City, New York; and Lowell and Fitchburg/Leominster, Massachusetts.

Smokers' Beliefs — Continued

CDC's Office on Smoking and Health, Center for Chronic Disease Prevention and Health Promotion (CCDPHP), is initiating a public information campaign on the health benefits of smoking cessation for older Americans based on the theme "It's never to late to quit smoking." The program is being conducted in collaboration with the National Institutes of Health, the Administration on Aging, the Department of Veterans Affairs, the Office of Disease Prevention and Health Promotion, the American Association of Retired Persons, and the Fox Chase Cancer Center. Information on this campaign and print materials are available from the Office on Smoking and Health, CCDPHP, CDC, 5600 Fishers Lane, Rockville, MD 20857; telephone (301) 443-5287.

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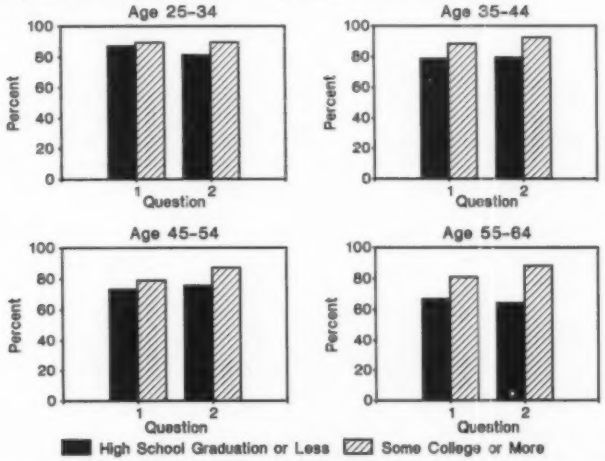
FIGURE 1. Percentage of smokers who reported* that quitting reduces their risk for disease, by age and education level — 20 U.S. communities†



*Question number 1: Percentage who responded "very likely" or "likely" to the question "How likely do you think it is that you will avoid or decrease serious health problems from smoking if you quit?"
Question number 2: Percentage who responded "strongly disagree" or "disagree" to the statement "If a person has smoked for more than 20 years, there is little health benefit to quitting."

†Bellingham and Longview/Kelso, Washington; Albany/Corvallis and Medford/Ashland, Oregon; Vallejo and Hayward, California; Santa Fe and Las Cruces, New Mexico; Cedar Rapids and Davenport, Iowa; Raleigh and Greensboro, North Carolina; Paterson and Trenton, New Jersey; Yonkers, New Rochelle, Utica, and Binghamton/Johnson City, New York; and Lowell and Fitchburg/Leominster, Massachusetts.

Smokers' Beliefs — Continued

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Current Trends

Smoking-Related Mortality Decline among Physicians — Rhode Island

Declines in smoking in the United States have contributed to declines in heart disease, stroke, and lung cancer among white men (*1,2*). In Rhode Island, where prevalence of smoking by physicians has been monitored since 1963, the proportion of physicians aged ≥25 years who smoke declined by 73% from 1963 to 1983 (Table 1). To characterize smoking-related mortality trends among white male physicians and other white males in Rhode Island, the Rhode Island Department of Health examined vital statistics data from that state. This report summarizes the findings from that study.

For 1968–1987, death certificate information for deaths of resident Rhode Island white men aged ≥25 years was sorted by age, cause of death, and occupation. The eighth and ninth revisions of the *International Classification of Diseases* (ICD) were used to group deaths by the following categories: all causes, major smoking-related cancers (oral, larynx, pharynx, esophagus, trachea, bronchus, lung, pancreas, and bladder) and heart disease and stroke (*3,4*). Definitions from the 1970 U.S. Census were used to group deaths by occupational categories, including physicians, other professionals (professional, technical, and kindred workers), and others (*5*). ICD-8 and ICD-9 rubrics were used to aggregate deaths for 1968–1978 and 1979–1987, respectively.

TABLE 1. Percentage of white men aged ≥25 years who smoke cigarettes, by occupation — Rhode Island and United States, circa 1965, 1975, 1985

Location/Occupation	Percentage who smoke cigarettes		
	1965	1975	1985
United States*	**51**	**42†**	**31**
Rhode Island		**44**	**31**
Physician§	33	19	9
Nonphysician		44	31
Professional		32	25
Other		46	33

*Source: NCHS. Health, United States, 1989. Hyattsville, Maryland: US Department of Health and Human Services, Public Health Service, CDC, 1990.
†U.S. population surveyed in 1974.
§Rhode Island physicians surveyed in 1963, 1973, and 1983.

Smoking-Related Mortality Decline — Continued

Census data for 1970 and 1980 were used to estimate the populations of physicians and "others"; the population of "other professionals" could not be estimated reliably from available census data. The 1970 U.S. population was used to standardize death rates by age. Rates were calculated for persons 25–64 years of age to ensure compatibility between the two sources of data; counts of deaths included retirees, and estimates of the populations at risk did not.

Proportionate mortality ratios (PMRs) (which do not require estimates of populations at risk) were used to compare the mortality of white male physicians aged ≥25 years with that of white male nonphysicians aged ≥25 years.

From 1968 through 1987, 89,593 white males died in Rhode Island, including 420 physicians and 10,640 other professionals. Smoking-related cancers accounted for 11% of deaths, and heart disease and stroke for 50%. Among persons aged 25–64 years, mortality from all causes declined substantially (among physicians, 38%; among nonphysicians, 19%) (Table 2). Among physicians, smoking-related cancer mortality decreased 38%, compared with a 3% decline among nonphysicians. Mortality from heart disease and stroke declined 57% among physicians and 32% among nonphysicians.

For both periods, PMRs for smoking-related cancers were <1.0 among physicians and other professionals and >1.0 among other white males (Table 3). PMRs for smoking-related cancers declined moderately among physicians and remained relatively constant among other professionals and other men. PMRs for heart disease and stroke in the earlier period were >1.0 among physicians and other professionals, decreasing over time among physicians but increasing over time among other professionals.

Reported by: HD Scott, MD, JP Fulton, PhD, JS Buechner, PhD, WJ Waters, PhD, JT Tierney, MSW, Rhode Island Dept of Health.

Editorial Note: These findings indicate that, for the two periods compared (1968–1978 and 1979–1987), white male physicians in Rhode Island experienced greater declines in overall mortality, smoking-related cancers, and cardiovascular diseases than did white males in other occupations. However, these findings are based on

TABLE 2. Age-standardized death rates* (SDRs) from all causes, smoking-related cancers, and cardiovascular diseases among resident white men aged 25–64 years, by occupation — Rhode Island, 1968–1978 and 1979–1987

	1968–1978		1979–1987	
Disease/Occupation	**SDR**	**95% CI†**	**SDR**	**95% CI†**
All causes				
Physician	536	414–658	331	228–434
Nonphysician	755	744–766	611	600–623
Smoking-related cancers				
Physician	74	28–120	46	9–83
Nonphysician	98	94–102	95	90–99
Cardiovascular diseases				
Physician	246	164–328	105	47–163
Nonphysician	352	344–359	241	234–249

*Per 100,000 population at risk.
†Confidence interval (calculated in the manner of Keyfitz [6]).

Smoking-Related Mortality Decline — Continued

TABLE 3. Proportionate mortality ratios (PMRs) for smoking-related cancers and cardiovascular diseases among resident white men aged ≥25 years, by occupation — Rhode Island, 1968–1978 and 1979–1987

	1968–1978		1979–1987	
Disease/Occupation	**PMR**	**95% CI***	**PMR**	**95% CI***
Smoking-related cancers				
Physician	0.83	0.51–1.36	0.70	0.46–1.06
Nonphysician				
Professional	0.87	0.78–0.97	0.84	0.76–0.93
Other	1.01	1.00–1.02	1.02	1.01–1.03
Cardiovascular diseases				
Physician	1.04	0.95–1.13	0.98	0.01–1.46
Nonphysician				
Professional	1.02	0.79–1.32	1.04	0.99–1.09
Other	1.00	1.00–1.00	1.00	1.00–1.00

*Confidence interval (calculated from Mantel-Haenszel chi-square values [7]).

relatively small numbers of deaths and denominators and reflect moderate statistical variation. In addition, other risk factors for specific diseases are not considered in this analysis and may affect the results.

The Rhode Island data suggest a method for examining the population effects of smoking cessation on mortality trends among populations whose members have quit smoking in substantial numbers. Based on the study of physicians in Rhode Island, at least half the current cardiovascular and smoking-related cancer mortality of 25–64-year-old nonphysician white men in that state may be preventable. The Rhode Island Department of Health will use these data to strengthen support for antismoking programs in the state.

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Cigarette Smoking among Reproductive-Aged Women — Idaho and New York

Smoking by mothers during pregnancy is associated with a range of serious adverse pregnancy outcomes. To identify strategies to reduce the prevalence of maternal smoking during pregnancy, state health departments should have current and specific information about smoking practices of these reproductive-aged women. This report presents findings from surveys conducted in Idaho and New York to determine family planning needs of reproductive-aged women; the surveys also gathered information on cigarette smoking practices of these women. The sampling methods and questionnaire were similar in both states (*1,2*).

During 1985, the Idaho Department of Health and Welfare conducted the first statewide Female Health Needs Assessment Telephone Survey. Clusters of residential telephone numbers were sampled to identify women aged 18–44 years; 2025 women were administered a standardized questionnaire regarding their smoking practices, their use of family planning methods, and other reproductive health topics (*1*). The New York Reproductive Health Survey was conducted during late 1988 and early 1989. Computer-assisted telephone interviews were used to collect data from 1910 women aged 15–44 years living in New York, excluding New York City (*2*). For this report, analysis of the New York data was restricted to 1809 women aged 18–44 years. In both surveys, current cigarette smoking was defined as responding "yes" to the question "Do you smoke cigarettes now?"

In Idaho and New York, 25.0% (95% confidence interval [CI] = 22.8–27.1) and 31.6% (95% CI = 29.0–34.1) of respondents, respectively, reported that they currently smoked cigarettes. Prevalence of current smoking did not vary substantially in either state by age group. In both states, however, unmarried women were more likely than married* women to be current smokers; 32.3% (95% CI = 26.8–37.7) and 36.7% (95% CI = 31.6–41.8) of unmarried women in Idaho and New York, respectively, were current smokers, compared with 23.1% (95% CI = 20.9–25.4) and 28.7% (95% CI = 25.8–31.7) of married women in Idaho and New York, respectively. Smoking prevalence also varied inversely with level of education in both states; in Idaho and New York, 55.2% (95% CI = 47.4–63.0) and 43.1% (95% CI = 38.8–47.5), respectively, of respondents with <12 years of education were current smokers, compared with 16.0% (95% CI = 13.5–18.4) and 18.6% (95% CI = 12.1–25.0) of respondents with >12 years of education in Idaho and New York, respectively.

In Idaho, where information was collected about religious affiliation, 11.4% of Mormons were current smokers, compared with 28.2% of Protestants, 31.9% of Roman Catholics, and 42.9% of women who reported no religious affiliation. In New York, women who reported an annual income <$25,000 were more likely to smoke (40.4% [95% CI = 34.4–46.4]) than those who reported an income ≥$35,000 per year (26.3% [95% CI = 22.8–29.9]). Among women who were current smokers, 20.0% (95% CI = 16.4–23.8) in Idaho and 14.2% (95% CI = 10.6–17.7) in New York reported smoking more than one pack of cigarettes per day.

In both states, women who reported having had a liveborn child were asked about their smoking practices during their most recent pregnancy. In Idaho and New York, 19.9% and 26.1% of women, respectively, smoked during their most recent pregnancy

*Married women comprised those currently married and those living with a partner or boyfriend.

Smoking among Reproductive-Aged Women — Continued

(Table 1). In both states, women with less than a high school education were more likely to smoke during pregnancy, as were unmarried women. In Idaho, Mormon women were least likely to smoke during pregnancy (9.7%). In New York, white women and women with an annual income <$25,000 were more likely to smoke during pregnancy. In Idaho and New York, nearly equal percentages of women smoked more than one pack of cigarettes per day during pregnancy (12.1% [95% CI = 8.0–16.3] and 11.6% [95% CI = 7.1–16.0], respectively).

In Idaho, 27.7% (95% CI = 22.1–33.2) of women taking oral contraceptives were current smokers; of oral contraceptive users aged 30–44 years, 30.4% (95% CI = 18.1–42.6) smoked. In New York, 33.3% (95% CI = 27.0–39.6) of women taking oral contraceptives also smoked; of oral contraceptive users 30–44 years of age, 20.3% (95% CI = 11.0–29.5) smoked.

TABLE 1. Percentage of reproductive-aged women who smoked during most recent pregnancy, by selected characteristics — Idaho, 1985, and New York, 1988–89

	Idaho (n = 1481)		New York (n = 1112)	
Characteristic	**%***	**95% CI†**	**%***	**95% CI**
Age (yrs)				
18–24	21.2	14.5–28.0	25.6	15.2–36.0
25–34	18.1	15.0–21.2	26.3	22.1–30.5
35–44	21.4	17.8–24.9	25.9	21.5–30.4
Education (yrs)				
<12	45 2	37.2–53.3	34.8	29.9–39.6
12	22.7	18.8–26.6	18.7	14.8–22.7
>12	10.9	8.3–13.4	15.5	8.0–23.0
Marital status				
Married§	18.5	16.1–20.9	24.5	21.3–27.7
Unmarried	30.7	23.4–38.0	33.7	25.8–41.6
Religion				
Mormon	9.7	7.2–12.2	–	–
Protestant	22.6	19.1–26.2	–	–
Roman Catholic	23.3	16.5–30.1	–	–
None	39.5	30.9–48.1	–	–
Race				
White	–	–	28.1	24.8–31.3
Other	–	–	15.2	8.4–21.9
Annual income				
<$25,000	21.3	18.4–24.2	35.3	28.4–42.1
$25,000–$34,999	16.5	11.6–21.3	31.3	24.7–37.8
≥$35,000	**17.7**	**12.5–23.0**	**21.7**	**17.6–25.9**
Total	19.9	17.6–22.2	26.1	23.2–29.0

*Percentages weighted to account for sampling.
†Confidence interval.
§Married women comprised those currently married and those living with a partner or boyfriend.

Smoking among Reproductive-Aged Women — Continued

Reported by: SE Ault, FR Dixon, MD, State Epidemiologist, Idaho Dept of Health and Welfare. ML Woelfel, MA, A Shuttleworth, DL Morse, MD, State Epidemiologist, New York State Dept of Health. Div of Reproductive Health, Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: Maternal smoking during pregnancy is associated with a doubling in the risk for low birth weight and with an increased risk for placenta previa, abruptio placentae, bleeding during pregnancy, spontaneous abortion, and preterm rupture of membranes (*3*). The 1990 Health Objectives for the Nation recommended that the proportion of pregnant women who smoke should be no more than one half the proportion of all women who smoke (*4*); results from these surveys indicate this objective is unlikely to be met.

Based on the reported number of live births for 1987 in Idaho and New York (*5*) and on the prevalence of smoking during pregnancy (data from these surveys), each year approximately 3200 infants in Idaho and 71,000 infants in New York are exposed to the potentially harmful effects of maternal smoking during pregnancy.

In both states, a substantial proportion of women who used oral contraceptives also were current smokers. For women who use oral contraceptives and smoke cigarettes, the risk for both myocardial infarction and stroke is increased, especially for older women (*6,7*). Therefore, smoking cessation counseling is particularly important for women taking oral contraceptives (*8*).

Estimates of reproductive health needs within states are often based on national or regional estimates of such needs. However, data for local areas may not exist or may differ strikingly from national data—particularly for teenagers, unmarried women, and certain racial groups. For example, among women 15–17 years of age in New York, 29.3% were current smokers (*2*). National surveys may not adequately sample specific subpopulations important in particular states. In the Idaho study, for example, smoking practices among Mormon women, a religious group that advocates healthy behaviors, could be compared with that of women representing other religious groups in that state. These findings underscore the potential usefulness of data from state-specific surveys to program planners and administrators who must allocate and target available resources in local areas.

During the 1980s, the prevalence of smoking in the United States declined, although the decline occurred at a slower rate for women than for men (*9*). Therefore, smoking prevention and cessation efforts should be focused on women. Health-care personnel who provide family planning and prenatal care services should incorporate these efforts into their counseling of reproductive-aged women.

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Smoking among Reproductive-Aged Women — Continued

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Effects of Maternal Cigarette Smoking on Birth Weight and Preterm Birth — Ohio, 1989

In 1989, most states began using revised birth certificates that provide more detailed information about maternal behaviors during pregnancy and complications of pregnancy. The availability of information on cigarette smoking by mothers in Ohio permitted the Ohio Department of Health (ODH) to examine the proportion of low birth weight (LBW), very low birth weight (VLBW), and preterm births that were attributable to maternal cigarette smoking.

The ODH study included live infants born to Ohio resident mothers in Ohio hospitals from January 1 through June 30, 1989. The analysis was restricted to singleton infants of white (n = 62,732) and black (n = 11,407) mothers. Gestational age was imputed in the 12% of certificates for which a direct estimate from the date of the last menstrual period was not possible; calculations were based on both birth weight and months of completed gestation (*1*). An infant was classified as having LBW if the birth weight was <2500 g (<5 lbs 8 oz), having VLBW if the birth weight was <1500 g (<3 lbs 4 oz), and being born preterm if the gestational age was <37 weeks. The Ohio birth certificate includes these items: "Tobacco use during pregnancy" and "Average number of cigarettes per day."

Multiple logistic regression was used to control for factors that affect the risk for LBW and preterm delivery, including mother's educational attainment (a measure of socioeconomic status), age, race, prepregnancy weight, and weight gain and alcohol consumption during pregnancy; child's birth order; the month prenatal care began; and previous terminations of pregnancy.

Odds ratios (ORs) were estimated for LBW, VLBW, and preterm birth in relation to in utero exposure to maternal cigarette smoking; these ORs represent measures of the risk for these outcomes in women who smoked compared with nonsmoking women. These findings permitted estimation of the population-attributable risk percentage (PAR%) (i.e., the proportion of all LBW, VLBW, and preterm birth attributable to maternal smoking). The PAR% was approximated as $(p \times [OR-1]) \times 100 \div (p \times [OR-1] + 1)$, where p is the proportion of women in the total population who smoke and OR is estimated in the multivariate model.

Overall, 23% of Ohio mothers were reported to have smoked during pregnancy; this prevalence did not vary by race. Among smokers, white women were more likely than black women (8.8% and 4.7%, respectively) to smoke more than one pack of cigarettes per day during pregnancy. The overall rate of LBW was 5.7%: for whites it was 4.8%; for blacks, 12.1% (Table 1). Overall rates of VLBW and preterm birth were approximately 2–3 times higher for blacks than for whites. Among whites, all three outcomes were more prevalent among younger women; among black women, variation by age group was limited.

Maternal Cigarette Smoking — Continued

Infants born to smokers were more than twice as likely to have LBW as were infants born to nonsmokers (Table 2). In addition, among women who smoked, risk for LBW increased by level of exposure: adjusted ORs were 1.8, 2.2, and 2.4 for light (less than one half pack per day), moderate (one half pack to one pack per day), and heavy smokers (more than one pack per day), respectively. Consumption of even <10 cigarettes per day appeared to double the risk for LBW. For both blacks and whites, the risk was directly proportionate to levels of smoking.

Maternal cigarette smoking also increased the risk for VLBW and preterm birth (Table 3). However, these risks were similar for light and heavy smokers.

An estimated 20% of all LBW in the total Ohio population (i.e., smokers and nonsmokers) in the 6-month period was attributable to maternal smoking (Table 3). Similarly, more than 8% of all VLBW and more than 6% of all preterm deliveries were attributable to smoking. For each of the three outcomes, adjusted ORs and PAR% were slightly lower for blacks than for whites.

Reported by: RS Hopkins, MD, LE Tyler, MS, BK Mortensen, PhD, Div of Epidemiology and Toxicology, Bur of Preventive Medicine, Ohio Dept of Health. Pregnancy and Infant Health Br,

TABLE 1. Percentage of low birth weight (LBW), very low birth weight (VLBW), and preterm birth, by mother's race and age — Ohio, January–June 1989*

Race/Age (yrs)	% LBW	% VLBW	% Preterm
White			
<20	7.8	1.6	12.6
20–34	4.4	0.7	7.5
≥35	4.6	0.7	7.4
Total	**4.8**	**0.8**	**8.1**
Black			
<20	11.7	2.3	19.3
20–34	12.2	2.6	17.2
≥35	14.2	3.4	18.0
Total	**12.1**	**2.6**	**17.8**

*Data based on Ohio birth certificate information.

TABLE 2. Low birth weight (LBW) among singleton infants, by mother's cigarette consumption and race — Ohio, January–June 1989*

Packs per day	White				Black				Odds ratio§
	LBW	(%)	Total	RR†	LBW	(%)	Total	RR	
None	1,744	(3.6)	48,427	1.0¶	871	(9.9)	8,780	1.0¶	1.0¶
<½	223	(6.8)	3,303	1.9	167	(15.1)	1,103	1.5	1.8
½–1	435	(8.0)	5,459	2.2	167	(16.8)	992	1.7	2.2
>1	497	(9.0)	5,543	2.5	125	(23.5)	532	2.4	2.4
Total	**2,899**	**(4.6)**	**62,732**	—	**1,330**	**(11.7)**	**11,407**	—	—

*Data based on Ohio birth certificate information.
†Relative risk.
§Adjusted for mother's educational attainment, age, race, prepregnancy weight, and weight gain and alcohol consumption during pregnancy; child's birth order; the month prenatal care began; and previous terminations of pregnancy. Birth certificates with unknowns for any of these variables were excluded.
¶Referent group.

Maternal Cigarette Smoking — Continued

TABLE 3. Crude and adjusted odds ratios and population-attributable risk percentage (PAR%)* for low birth weight (LBW), very low birth weight (VLBW), and preterm birth in relation to maternal cigarette smoking during pregnancy — Ohio, January–June 1989†

Measure	LBW	VLBW	Preterm birth
Crude odds ratio	2.2	1.6	1.5
Adjusted odds ratio§	2.1	1.4	1.3
PAR%	20.2%	8.4%	6.5%

*PAR% was approximated as $(p \times [OR-1]) \times 100 \div (p \times [OR-1] + 1)$, where p is the proportion of persons in the total population exposed to the hazard and OR is the odds ratio estimated in the multivariate model.

†Data based on Ohio birth certificate information.

§Adjusted for mother's educational attainment, age, race, prepregnancy weight, and weight gain and alcohol consumption during pregnancy; child's birth order; the month prenatal care began; and previous terminations of pregnancy. Birth certificates with unknowns for any of these variables were excluded.

Div of Reproductive Health, Center for Chronic Disease Prevention and Health Promotion; National Center for Health Statistics, CDC.

Editorial Note: Smoking by mothers is an important preventable cause of adverse pregnancy outcome (*2*). In Ohio, the deleterious effects of cigarette smoking by mothers during pregnancy on the rates of LBW, VLBW, and preterm birth were substantial, even when adjusted for other risk factors identified from the birth certificates. The effect of smoking on fetal growth may be partially mediated through lower maternal weight gain. The adjustment for maternal weight gain in this multivariate model may have underestimated the ORs for LBW and VLBW and thus the PAR%. Conversely, the effects reported here could also partially reflect the impact of other factors (e.g., illegal drug use) that were not reported on the birth certificate but that are more common among smokers than nonsmokers (*3*). Under these circumstances, the PAR% may have been slightly overestimated.

This study relied on data collected during the first 6 months of use of the revised Ohio birth certificate; the reliability of the smoking-related and other data may be expected to improve over time as reporting of new information becomes routine. Nonetheless, the findings in Ohio are similar to those in other studies, some of which used different data sources (*2,4–7*).

Birth certificates are a useful surveillance tool for identifying subgroups of women who are likely to smoke during pregnancy. These subgroups can then be targeted for special prevention or cessation efforts. Birth certificate data can also be used to evaluate the success of a state's antismoking programs. In 1989, only seven states did not collect information about maternal smoking habits that was comparable to that collected in Ohio on birth certificates.

Smoking during pregnancy increases infant morbidity and mortality through effects on birth weight and preterm birth (*5,6*). In Ohio and other states, successful efforts to reduce or eliminate smoking during pregnancy could substantially reduce rates of LBW, VLBW, and preterm birth and, in turn, reduce infant morbidity and mortality and the cost of health care in the state (*8*).

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Cigarette Brand Use among Adult Smokers — United States, 1986

Information about the use of cigarette brands is important to the development of smoking-prevention and smoking-cessation strategies. This report summarizes data from the 1986 Adult Use of Tobacco Survey (AUTS), which describe the brand of cigarettes smoked as reported by respondents; the data are presented by sex, race, age, and level of educational attainment.

The AUTS, conducted by CDC's Office on Smoking and Health, Center for Chronic Disease Prevention and Health Promotion, was designed to assess the knowledge, attitudes, and practices of adults regarding all forms of tobacco use. Data for this telephone survey, conducted primarily during October through December of 1986, were collected from a national probability sample of 13,031 respondents ≥17 years of age and were weighted to represent the civilian, noninstitutionalized, adult U.S. population. According to the AUTS, an estimated 26.5% (approximately 46.8 million) of adults were smoking cigarettes in 1986 (*1,2*).

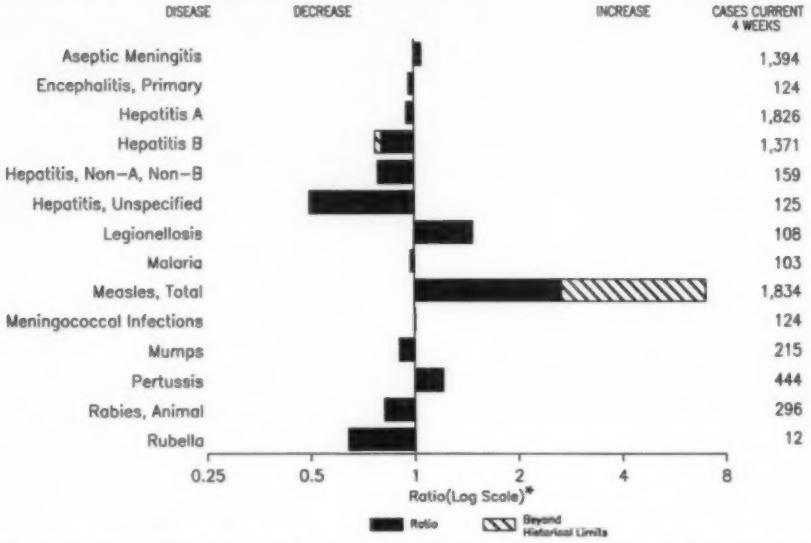
Data from the 4700 current cigarette smokers in 1986 who responded to the AUTS were used in this analysis. Current brand use was determined by responses to the question, "What brand of cigarettes do you usually smoke now?" (*1*). A series of follow-up questions were used to determine the specific variety of the brand used (e.g., mentholated vs. nonmentholated and "lights" vs. regular). In this report, however, data are presented only by overall brand categories. Market share data* are provided for comparison.

In 1986, the 12 most commonly named brands of cigarettes smoked were used by 74.7% of all current smokers and accounted for 72.6% of the cigarette market (*3*) (Table 1, page 671). Marlboro, Winston, Salem, Kool, and Newport—the top five brands smoked—were used by 52.0% of current smokers and accounted for 52.1% of the cigarette market. The percentage of smokers who reported using Marlboro (24.1%) was more than double the percentage who reported using Winston (9.6%), the next most commonly named brand (these findings were also consistent with known market share patterns [*3*]).

*Percentage of all cigarettes sold in the United States, by brand. Market share data are collected quarterly by a tobacco industry analyst (*3*).

(Continued on page 671)

FIGURE I. Notifiable disease reports, comparison of 4-week totals ending September 22, 1990, with historical data — United States



*Ratio of current 4-week total to mean of 15 4-week totals (from comparable, previous, and subsequent 4-week periods for past 5 years).

TABLE I. Summary — cases of specified notifiable diseases, United States, cumulative, week ending September 22, 1990 (38th Week)

	Cum. 1990		Cum. 1990
AIDS	30,875	Plague	1
Anthrax	-	Poliomyelitis, Paralytic*	-
Botulism: Foodborne	14	Psittacosis	86
Infant	47	Rabies, human	1
Other	5	Syphilis: civilian	34,471
Brucellosis	56	military	177
Cholera	4	Syphilis, congenital, age < 1 year	685
Congenital rubella syndrome	3	Tetanus	43
Diphtheria	2	Toxic shock syndrome	233
Encephalitis, post-infectious	73	Trichinosis	22
Gonorrhea: civilian	481,068	Tuberculosis	16,828
military	6,421	Tularemia	102
Leprosy	156	Typhoid fever	344
Leptospirosis	34	Typhus fever, tickborne (RMSF)	487
Measles: imported	1,038		
indigenous	20,227		

*Three cases of suspected poliomyelitis have been reported in 1990; five of 13 suspected cases in 1989 were confirmed and all were vaccine-associated.

TABLE II. Cases of specified notifiable diseases, United States, weeks ending September 22, 1990, and September 23, 1989 (38th Week)

Reporting Area	AIDS	Aseptic Meningitis	Encephalitis		Gonorrhea (Civilian)		Hepatitis (Viral), by type				Legionellosis	Leprosy
			Primary	Post-infectious			A	B	NA,NB	Unspecified		
	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1989	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1990
UNITED STATES	30,875	6,233	621	73	481,068	505,146	20,780	14,621	1,629	1,223	901	156
NEW ENGLAND	1,096	253	21	-	13,545	14,571	436	778	53	52	39	10
Maine	43	8	3	-	147	201	7	24	4	1	4	-
N.H.	48	25	-	-	119	122	7	35	4	3	4	-
Vt.	13	25	2	-	43	47	5	38	4	-	5	-
Mass.	638	89	10	-	5,710	5,650	296	484	31	46	19	9
R.I.	56	76	1	-	841	1,058	45	35	-	2	7	1
Conn.	300	30	5	-	6,685	7,493	76	162	10	-	-	-
MID. ATLANTIC	9,519	605	36	6	65,265	74,158	2,952	1,965	174	84	288	19
Upstate N.Y.	1,201	331	29	1	10,309	11,288	835	535	57	22	110	1
N.Y. City	5,582	114	3	2	27,232	30,256	442	531	23	43	75	13
N.J.	1,823	-	1	-	10,848	11,131	342	434	35	-	43	4
Pa.	903	160	3	3	16,876	21,483	1,333	465	59	19	60	1
E.N. CENTRAL	2,131	1,390	164	12	90,292	91,600	1,618	1,700	154	74	220	2
Ohio	505	296	55	4	26,475	23,365	152	302	55	12	76	-
Ind.	177	205	6	6	8,126	6,747	113	299	10	15	34	-
Ill.	846	225	51	2	28,666	30,038	784	335	33	15	15	1
Mich.	416	605	46	-	21,436	23,624	291	481	26	32	62	1
Wis.	187	59	6	-	5,589	7,826	278	283	30	-	33	-
W.N. CENTRAL	727	321	57	2	25,243	22,776	1,233	676	100	30	44	1
Minn.	145	41	23	1	3,185	2,535	175	88	21	-	1	-
Iowa	25	59	5	-	1,843	1,963	232	47	8	4	4	-
Mo.	397	142	7	1	15,232	14,032	367	416	47	20	23	-
N. Dak.	2	16	3	-	76	108	14	5	2	1	1	-
S. Dak.	2	5	2	-	184	197	182	7	3	-	1	-
Nebr.	43	25	7	-	1,306	1,022	73	26	4	-	9	1
Kans.	113	33	10	-	3,417	2,919	190	87	15	5	5	-
S. ATLANTIC	6,354	1,242	144	21	138,193	136,280	2,475	2,800	236	178	137	5
Del.	72	30	3	-	2,231	2,331	95	71	6	2	10	-
Md.	645	157	17	1	16,361	15,799	828	391	37	9	53	3
D.C.	521	8	-	-	9,558	8,287	13	31	4	-	-	-
Va.	571	214	40	1	12,902	11,482	219	178	33	128	11	-
W. Va.	55	40	38	-	851	1,026	17	62	4	6	3	-
N.C.	409	142	29	-	20,890	20,614	541	792	88	-	21	1
S.C.	258	15	1	-	11,054	12,502	33	451	14	8	15	-
Ga.	775	227	4	1	30,381	26,174	291	327	8	7	15	-
Fla.	3,048	409	12	18	33,965	38,065	438	497	42	18	9	1
E.S. CENTRAL	780	497	46	2	41,767	40,072	284	1,152	135	6	49	-
Ky.	136	117	19	-	4,399	3,911	69	406	39	4	20	-
Tenn.	261	90	20	2	12,550	13,392	129	612	78	-	16	-
Ala.	167	206	7	-	14,441	12,827	85	130	16	1	13	-
Miss.	216	84	-	-	10,377	9,942	1	4	2	1	-	-
W.S. CENTRAL	3,297	545	36	7	51,586	53,048	2,145	1,509	67	203	40	32
Ark.	168	13	1	-	6,474	6,016	387	60	7	19	7	-
La.	476	69	6	-	9,039	11,369	142	238	4	7	13	-
Okla.	158	55	3	6	4,434	4,622	409	113	19	26	13	-
Tex.	2,495	408	26	1	31,639	31,041	1,207	1,098	37	151	7	32
MOUNTAIN	853	273	19	2	9,585	10,741	3,379	1,103	160	94	34	-
Mont.	11	4	-	-	132	142	132	53	6	4	3	-
Idaho	19	7	-	-	105	137	78	62	8	-	3	-
Wyo.	2	1	1	-	117	75	48	13	5	1	1	-
Colo.	263	61	4	-	2,150	2,289	216	121	36	31	6	-
N. Mex.	75	13	-	-	924	987	679	148	9	7	3	-
Ariz.	264	138	7	-	3,929	4,433	1,579	393	60	36	10	-
Utah	82	25	3	-	304	342	393	82	21	5	3	-
Nev.	137	24	4	2	1,924	2,336	254	231	15	10	5	-
PACIFIC	6,116	1,107	98	21	45,592	61,900	5,258	2,938	550	502	50	87
Wash.	436	-	6	1	3,817	4,776	1,046	429	92	28	11	5
Oreg.	230	-	-	-	1,872	2,260	849	306	43	7	-	-
Calif.	5,300	938	86	19	38,768	53,768	4,347	2,105	401	459	38	69
Alaska	23	100	6	-	776	691	153	46	5	3	-	-
Hawaii	127	69	1	1	359	405	63	52	9	5	1	13
Guam	2	2	-	-	162	123	11	2	-	10	-	-
P.R.	1,221	46	6	-	509	794	117	239	5	22	-	-
V.I.	10	-	-	-	321	491	1	10	-	-	-	-
Amer. Samoa	-	1	-	-	49	38	26	-	-	-	-	10
C.N.M.I.	-	-	-	-	150	73	10	9	-	15	-	4

N: Not notifiable U: Unavailable C.N.M.I.: Commonwealth of the Northern Mariana Islands

TABLE II. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending September 22, 1990, and September 23, 1989 (38th Week)

Reporting Area	Malaria	Measles (Rubeola)					Menin-gococcal Infections	Mumps		Pertussis			Rubella		
		Indigenous		Imported*		Total									
	Cum. 1990	1990	Cum. 1990	1990	Cum. 1990	Cum. 1989	Cum. 1990	1990	Cum. 1990	1990	Cum. 1990	Cum. 1989	1990	Cum. 1990	Cum. 1989
UNITED STATES	856	197	20,227	3	1,038	12,645	1,636	50	4,060	110	2,662	2,608	-	796	304
NEW ENGLAND	73	-	256	-	25	322	139	1	37	14	308	289	-	8	6
Maine	1	-	27	-	2	1	12	-	-	-	10	17	-	1	-
N.H.	4	-	-	-	8	15	10	1	9	4	44	6	-	1	4
Vt.	6	-	-	-	1	3	10	-	1	-	6	6	-	-	1
Mass.	38	-	19	-	7	49	64	-	11	7	226	233	-	2	1
R.I.	7	-	27	-	3	41	12	-	5	1	4	11	-	1	-
Conn.	17	-	183	-	4	213	31	-	11	2	18	16	-	3	-
MID. ATLANTIC	188	9	1,131	-	154	939	273	9	263	5	415	177	-	11	31
Upstate N.Y.	39	-	200	-	110	140	102	9	115	5	288	77	-	10	13
N.Y. City	67	-	322	-	21	102	41	-	-	-	-	5	-	-	15
N.J.	59	-	234	-	14	434	63	-	63	-	21	29	-	-	3
Pa.	23	9	375	-	9	263	67	-	85	-	106	66	-	1	-
E.N. CENTRAL	52	-	3,237	-	143	4,260	244	4	439	5	505	361	-	31	25
Ohio	7	-	549	-	3	1,133	75	-	89	-	154	45	-	1	3
Ind.	3	-	323	-	1	78	25	-	20	-	90	19	-	-	-
Ill.	22	-	1,274	-	10	2,502	64	-	152	-	100	122	-	18	20
Mich.	16	-	348	-	125	321	59	4	132	5	70	35	-	9	1
Wis.	4	-	743	-	4	226	21	-	46	-	91	140	-	3	1
W.N. CENTRAL	16	-	853	-	13	652	58	2	131	8	154	184	-	22	6
Minn.	4	-	392	-	3	22	11	-	14	-	31	50	-	17	-
Iowa	2	-	25	-	1	9	1	-	18	1	18	14	-	4	1
Mo.	9	-	96	-	-	368	23	1	54	3	79	109	-	-	4
N. Dak.	-	-	-	-	-	-	1	-	-	-	2	2	-	1	-
S. Dak.	-	-	15	-	8	-	2	-	-	-	1	1	-	-	-
Nebr.	-	-	97	-	1	113	5	1	5	-	7	5	-	-	-
Kans.	1	-	228	-	-	140	15	-	40	4	18	3	-	-	1
S. ATLANTIC	171	-	886	-	354	579	327	26	1,691	8	239	239	-	18	9
Del.	3	-	8	-	3	40	3	-	4	-	5	1	-	-	-
Md.	48	-	195	-	18	88	38	20	949	4	59	37	-	2	2
D.C.	10	-	15	-	7	40	11	1	33	-	14	-	-	1	-
Va.	43	-	82	-	2	22	40	-	95	-	17	28	-	1	-
W. Va.	2	-	6	-	-	51	13	1	41	-	17	24	-	-	-
N.C.	13	-	9	-	15	171	50	1	281	2	64	48	-	-	1
S.C.	-	-	4	-	-	3	23	1	50	-	5	-	-	-	-
Ga.	15	-	82	-	239	2	56	-	82	-	24	33	-	-	-
Fla.	37	-	485	-	70	162	93	2	156	2	34	68	-	14	6
E.S. CENTRAL	18	4	181	-	3	229	111	-	87	6	136	175	-	5	3
Ky.	2	-	40	-	1	40	33	-	-	-	-	1	-	1	-
Tenn.	9	4	92	-	-	139	46	-	49	5	64	105	-	4	2
Ala.	7	-	23	-	2	50	30	-	14	1	65	58	-	-	1
Miss.	-	-	26	-	-	-	2	-	24	-	7	11	-	-	-
W.S. CENTRAL	48	172	4,190	3	91	3,144	128	5	611	32	144	264	-	66	36
Ark.	3	-	16	-	28	15	16	1	134	1	14	21	-	3	-
La.	4	-	10	-	-	11	29	-	102	-	26	15	-	-	5
Okla.	9	-	175	-	-	106	16	-	107	3	45	46	-	1	1
Tex.	32	172	3,979	3†	63	3,012	67	4	268	28	59	182	-	62	30
MOUNTAIN	22	12	823	-	99	391	60	1	311	15	240	545	-	109	35
Mont.	1	-	-	-	1	13	10	-	1	3	32	33	-	14	1
Idaho	4	-	16	-	10	2	6	-	142	-	37	66	-	49	32
Wyo.	1	-	-	-	15	-	-	-	2	-	-	-	-	-	1
Colo.	2	1	91	-	46	82	17	-	23	11	74	45	-	4	-
N. Mex.	4	-	81	-	12	31	9	N	N	-	17	24	-	-	-
Ariz.	9	7	291	-	12	145	5	1	119	-	49	357	-	32	-
Utah	-	1	127	-	-	114	6	-	9	1	27	19	-	2	-
Nev.	1	3	217	-	3	4	7	-	15	-	4	1	-	8	1
PACIFIC	268	-	8,680	-	156	2,129	496	2	480	17	521	374	-	526	153
Wash.	20	-	202	-	69	54	62	1	44	5	142	151	-	-	-
Oreg.	12	-	168	-	44	29	54	N	N	5	63	12	-	10	4
Calif.	230	-	8,223	-	37	2,018	366	-	423	7	274	194	-	503	127
Alaska	2	-	78	-	2	1	9	-	4	-	4	1	-	-	-
Hawaii	4	-	9	-	4	30	5	1	19	-	38	16	-	13	22
Guam	3	U	-	U	1	4	-	U	3	U	-	1	U	-	-
P.R.	2	4	1,640	-	-	513	10	-	7	-	6	4	-	-	8
V.I.	-	-	21	-	3	4	-	-	9	-	-	-	-	-	-
Amer. Samoa	35	U	190	U	-	-	-	U	19	U	-	-	U	-	-
C.N.M.I.	-	U	-	U	-	-	-	U	8	U	4	-	U	-	-

*For measles only, imported cases includes both out-of-state and international importations.
N: Not notifiable U: Unavailable †International §Out-of-state

TABLE II. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending September 22, 1990, and September 23, 1989 (38th Week)

Reporting Area	Syphilis (Civilian) (Primary & Secondary)		Toxic-shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1990	Cum. 1989	Cum. 1990	Cum. 1990	Cum. 1989	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1990
UNITED STATES	34,471	31,039	233	16,828	15,282	102	344	487	3,126
NEW ENGLAND	1,260	1,233	18	405	422	3	22	15	5
Maine	7	9	7	6	12	-	-	-	-
N.H.	40	10	1	3	19	-	-	-	2
Vt.	1	1	-	8	8	-	-	-	-
Mass.	496	378	8	216	219	3	21	13	-
R.I.	15	25	1	52	47	-	-	-	-
Conn.	701	810	1	120	117	-	1	2	3
MID. ATLANTIC	6,984	6,396	22	4,062	2,968	1	73	22	688
Upstate N.Y.	648	639	8	299	237	-	14	12	91
N.Y. City	3,314	2,862	5	2,535	1,642	-	42	-	-
N.J.	1,148	1,011	-	674	593	1	14	7	232
Pa.	1,874	1,884	9	554	496	-	3	3	365
E.N. CENTRAL	2,414	1,299	55	1,634	1,561	2	25	41	140
Ohio	385	105	22	286	279	1	5	31	9
Ind.	64	47	1	138	138	1	1	1	9
Ill.	980	584	8	834	716	-	13	2	25
Mich.	745	446	24	312	339	-	5	7	46
Wis.	240	117	-	64	89	-	1	-	51
W.N. CENTRAL	393	245	25	439	380	35	5	45	500
Minn.	82	37	2	78	72	-	-	-	189
Iowa	56	29	6	44	28	-	1	1	17
Mo.	202	126	8	228	178	26	3	29	20
N. Dak.	1	3	-	16	12	-	-	-	72
S. Dak.	1	1	-	10	24	4	-	2	160
Nebr.	9	21	3	14	18	3	-	1	4
Kans.	42	28	6	49	48	2	1	12	38
S. ATLANTIC	11,349	11,166	21	3,182	3,255	3	60	212	879
Del.	135	140	1	26	31	-	-	1	21
Md.	868	576	1	233	277	-	30	15	324
D.C.	788	608	1	118	138	-	-	1	-
Va.	611	392	2	275	265	1	5	19	148
W. Va.	57	13	-	52	54	-	1	1	33
N.C.	1,268	771	10	417	409	1	2	125	7
S.C.	761	622	2	355	363	1	1	35	106
Ga.	2,940	2,786	1	541	510	-	2	13	160
Fla.	3,921	5,258	3	1,165	1,208	-	19	2	80
E.S. CENTRAL	3,172	2,017	12	1,190	1,205	7	2	64	137
Ky.	67	41	2	285	301	1	1	9	37
Tenn.	1,259	821	8	315	354	6	-	47	27
Ala.	1,004	655	2	375	344	-	1	8	70
Miss.	842	500	-	215	206	-	-	-	3
W.S. CENTRAL	5,306	4,274	11	1,963	1,818	34	11	70	377
Ark.	443	264	-	262	189	26	-	17	42
La.	1,171	1,032	1	170	249	-	-	2	28
Okla.	177	83	7	147	155	8	2	45	105
Tex.	3,515	2,895	3	1,384	1,225	-	9	6	202
MOUNTAIN	628	474	25	415	344	13	18	10	162
Mont.	-	1	-	22	11	-	-	4	40
Idaho	6	1	2	11	21	-	-	-	5
Wyo.	-	6	2	5	-	3	-	-	46
Colo.	37	58	7	27	39	3	-	1	11
N. Mex.	32	21	3	84	63	4	-	1	8
Ariz.	454	221	7	183	148	-	16	1	27
Utah	8	13	4	32	27	3	-	3	9
Nev.	91	153	-	51	35	-	2	-	16
PACIFIC	2,965	3,935	44	3,538	3,329	4	128	8	238
Wash.	252	338	4	205	174	1	20	-	-
Oreg.	102	178	2	94	105	-	4	1	1
Calif.	2,589	3,407	37	3,068	2,872	-	99	2	215
Alaska	14	3	-	31	46	3	-	-	22
Hawaii	8	9	1	140	132	-	5	5	-
Guam	2	4	-	33	60	-	-	-	-
P.R.	223	385	-	66	217	-	-	-	33
V.I.	10	8	-	4	4	-	-	-	-
Amer. Samoa	-	-	-	11	7	-	1	-	-
C.N.M.I.	3	8	-	40	19	-	4	-	-

U: Unavailable

TABLE III. Deaths in 121 U.S. cities,* week ending September 22, 1990 (38th Week)

Reporting Area	All Causes, By Age (Years)						P&I**
	All Ages	≥65	45-64	25-44	1-24	<1	Total
NEW ENGLAND	622	417	116	58	14	17	36
Boston, Mass.	168	92	38	24	6	8	9
Bridgeport, Conn.	47	33	9	3	1	1	3
Cambridge, Mass.	11	8	2	1	-	-	2
Fall River, Mass.	23	17	5	1	-	-	-
Hartford, Conn.	67	47	13	6	1	-	8
Lowell, Mass.	26	18	4	1	1	2	-
Lynn, Mass.	18	15	2	1	-	-	2
New Bedford, Mass.	21	14	7	-	-	-	-
New Haven, Conn.	47	33	6	5	1	2	2
Providence, R.I.	38	29	8	-	1	-	-
Somerville, Mass.	10	8	1	1	-	-	-
Springfield, Mass.	44	25	11	8	-	-	1
Waterbury, Conn.	28	21	3	1	3	-	1
Worcester, Mass.	74	57	7	6	-	4	8
MID. ATLANTIC	2,613	1,680	485	274	78	96	119
Albany, N.Y.	55	37	9	3	2	4	-
Allentown, Pa.	27	21	5	1	-	-	-
Buffalo, N.Y.	150	98	33	15	1	3	5
Camden, N.J.	54	29	14	6	4	1	-
Elizabeth, N.J.	19	12	5	1	-	1	3
Erie, Pa.†	30	24	3	3	-	-	2
Jersey City, N.J.	47	29	10	6	-	2	-
N.Y. City, N.Y.	1,288	805	250	156	44	33	44
Newark, N.J.	65	29	11	18	3	4	8
Paterson, N.J.	25	15	3	4	1	2	2
Philadelphia, Pa.	393	224	83	28	19	39	21
Pittsburgh, Pa.†	73	53	13	4	1	2	6
Reading, Pa.	35	32	2	1	-	-	5
Rochester, N.Y.	114	85	16	11	1	1	10
Schenectady, N.Y.	22	20	1	1	-	-	-
Scranton, Pa.†	24	19	2	3	-	-	1
Syracuse, N.Y.	114	89	15	7	1	2	5
Trenton, N.J.	22	15	2	3	-	2	2
Utica, N.Y.	14	11	2	1	-	-	2
Yonkers, N.Y.	42	33	6	2	1	-	3
E.N. CENTRAL	2,300	1,512	457	182	59	90	91
Akron, Ohio	48	39	5	2	1	1	-
Canton, Ohio	48	39	8	1	-	-	2
Chicago, Ill.§	564	362	125	45	10	22	16
Cincinnati, Ohio	140	91	31	12	3	3	9
Cleveland, Ohio	179	109	28	15	12	15	5
Columbus, Ohio	172	103	44	15	4	6	3
Dayton, Ohio	112	75	26	4	4	3	2
Detroit, Mich.	271	153	56	39	12	11	12
Evansville, Ind.	39	22	13	2	-	2	-
Fort Wayne, Ind.	51	36	10	2	2	1	2
Gary, Ind.	18	12	1	3	1	1	1
Grand Rapids, Mich.	53	37	10	5	-	1	7
Indianapolis, Ind.	153	93	38	7	4	11	7
Madison, Wis.§	35	26	5	4	-	-	2
Milwaukee, Wis.	124	95	19	6	1	3	4
Peoria, Ill.	38	28	1	4	1	4	4
Rockford, Ill.	47	35	6	3	2	1	3
South Bend, Ind.	42	36	3	2	-	1	2
Toledo, Ohio	100	69	15	10	2	4	5
Youngstown, Ohio	66	52	13	1	-	-	5
W.N. CENTRAL	677	474	117	49	25	12	41
Des Moines, Iowa	58	48	6	3	1	-	4
Duluth, Minn.	34	27	6	-	1	-	4
Kansas City, Kans.	22	14	6	2	-	-	-
Kansas City, Mo.	125	84	23	12	5	1	13
Lincoln, Nebr.	38	25	7	3	2	1	4
Minneapolis, Minn.	101	74	15	8	3	1	9
Omaha, Nebr.	57	41	9	3	3	1	3
St. Louis, Mo.	124	75	32	8	3	6	3
St. Paul, Minn.	60	50	1	4	4	1	-
Wichita, Kans.	58	36	12	6	3	1	1
S. ATLANTIC	1,071	627	238	130	36	40	50
Atlanta, Ga.	152	89	34	20	5	4	5
Baltimore, Md.	175	101	46	18	7	3	11
Charlotte, N.C.	96	53	17	17	4	5	5
Jacksonville, Fla.	103	61	26	7	3	6	8
Miami, Fla.	102	54	24	16	2	6	1
Norfolk, Va.	53	30	12	6	-	5	2
Richmond, Va.	67	44	14	8	1	-	5
Savannah, Ga.	43	30	8	5	-	-	3
St. Petersburg, Fla.	68	47	12	2	2	5	6
Tampa, Fla.	75	44	18	8	4	1	4
Washington, D.C.	117	60	25	19	8	5	-
Wilmington, Del.	20	14	2	4	-	-	-
E.S. CENTRAL	755	470	172	66	21	26	36
Birmingham, Ala.	114	63	26	16	4	5	3
Chattanooga, Tenn.	64	38	19	3	3	1	5
Knoxville, Tenn.	85	63	12	7	2	1	5
Louisville, Ky.	115	72	31	6	1	5	5
Memphis, Tenn.	157	97	32	16	4	8	11
Mobile, Ala.	76	43	20	6	5	2	-
Montgomery, Ala.	21	13	5	1	-	2	1
Nashville, Tenn.	123	81	27	11	2	2	6
W.S. CENTRAL	1,721	1,047	374	188	70	41	72
Austin, Tex.	60	34	11	10	4	1	7
Baton Rouge, La.	39	25	9	2	2	1	5
Corpus Christi, Tex.	31	23	6	-	2	-	-
Dallas, Tex.	217	126	51	24	11	5	3
El Paso, Tex.	56	33	14	6	2	-	5
Fort Worth, Tex	107	64	22	14	-	7	6
Houston, Tex.§	734	436	169	89	24	16	18
Little Rock, Ark.	80	51	18	5	4	2	2
New Orleans, La.	113	66	27	10	9	1	-
San Antonio, Tex.	158	103	31	13	6	5	14
Shreveport, La.	57	37	7	9	2	2	10
Tulsa, Okla.	69	49	9	6	4	1	2
MOUNTAIN	640	411	131	49	25	23	27
Albuquerque, N. Mex.	65	34	18	9	3	1	-
Colo. Springs, Colo.	35	25	5	3	2	-	2
Denver, Colo.	120	79	26	11	1	3	2
Las Vegas, Nev.	89	60	16	4	7	1	9
Ogden, Utah	22	15	3	1	-	3	2
Phoenix, Ariz.	156	96	34	11	4	11	7
Pueblo, Colo.	28	19	5	3	1	-	3
Salt Lake City, Utah	35	20	7	1	5	2	-
Tucson, Ariz.	90	63	17	6	2	2	2
PACIFIC	1,771	1,113	335	208	66	45	125
Berkeley, Calif.	17	12	1	1	2	1	-
Fresno, Calif.	109	69	21	7	4	8	16
Glendale, Calif.	10	9	-	1	-	-	-
Honolulu, Hawaii	87	64	14	8	-	1	11
Long Beach, Calif.	78	51	11	10	3	3	12
Los Angeles Calif.	391	216	83	61	18	10	17
Oakland, Calif.	60	36	13	4	5	2	2
Pasadena, Calif.	39	27	6	4	1	1	3
Portland, Oreg.	121	83	21	9	5	3	6
Sacramento, Calif.	146	93	30	14	6	3	14
San Diego, Calif.	122	74	27	16	5	-	10
San Francisco, Calif.	165	84	40	32	6	2	5
San Jose, Calif.	159	99	36	18	4	2	11
Seattle, Wash.	161	112	22	16	3	8	5
Spokane, Wash.	63	49	6	5	2	1	7
Tacoma, Wash.	43	35	4	2	2	-	6
TOTAL	12,170††	7,751	2,425	1,204	394	390	597

*Mortality data in this table are voluntarily reported from 121 cities in the United States, most of which have populations of 100,000 or more. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.

**Pneumonia and influenza.

†Because of changes in reporting methods in these 3 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.

††Total includes unknown ages.

§Data not available. Figures are estimates based on average of past available 4 weeks.

TABLE 1. Self-reported cigarette brand use among current cigare cigarette market shares — 1986 and 1989

		Ciga				
Characteristic	**No.**	**Marlboro**	**Winston**	**Salem**	**Kool**	**Newport**
Self-reported use*						
Overall	4700	24.1	9.6	8.2	5.6	4.5
Sex						
Male	2348	28.2	11.5	6.5	6.0	4.9
Female	2352	19.4	7.5	10.1	5.1	4.1
Race†						
White	4125	26.2	9.9	7.4	3.7	2.3
Black	438	6.0	5.7	15.3	18.8	21.0
Age (yrs)						
17–24	587	54.4	4.0	3.3	4.6	10.5
25–44	2434	25.9	9.5	10.0	7.0	5.5
45–64	1264	8.7	12.7	7.8	4.4	0.5
≥65	415	6.8	10.4	7.5	2.8	0.0
Education (yrs)						
<12	954	24.4	11.1	7.9	5.3	5.5
12	1961	24.6	9.6	8.3	6.3	4.8
13–15	1140	24.0	7.2	9.1	5.2	4.0
≥16	645	21.4	8.8	7.5	4.3	1.4
Market share						
1986		23.0	11.2	7.8	6.3	3.8
1989§		26.5	9.2	6.2	6.0	4.7

*Data weighted to represent the civilian, noninstitutionalized, adult (≥17
†Excludes the racial category "other" (n = 137).
§Preliminary data.

Brand Use — Continued

igarette smokers — Adult Use of Tobacco Survey, 1986; and

Cigarette brand (%)								
port	Benson and Hedges	Camel	Merit	Pall Mall	Vantage	Virginia Slims	Kent	Total
.5	4.3	4.0	3.8	2.9	2.8	2.7	2.2	**74.7**
.9	2.9	6.5	3.6	3.4	2.8	0.3	1.9	**78.4**
.1	5.9	1.3	4.1	2.4	2.9	5.3	2.5	**70.4**
.3	3.8	4.4	4.4	3.1	3.2	2.7	2.4	**73.5**
.0	8.1	0.8	0.1	2.0	0.4	3.0	0.5	**81.5**
.5	4.3	2.7	1.9	0.0	0.6	2.4	0.2	**88.7**
.5	4.1	4.2	5.0	1.0	2.7	3.3	1.4	**79.7**
.5	5.0	4.3	2.7	7.1	4.0	1.9	4.0	**63.0**
.0	3.7	4.4	3.1	6.3	4.1	2.0	4.7	**55.8**
.5	4.0	3.9	1.4	3.8	3.1	2.0	1.0	**73.4**
.8	3.0	4.6	3.8	3.0	2.8	3.0	2.4	**76.0**
.0	6.9	3.2	5.3	1.8	2.4	2.8	2.6	**74.5**
.4	6.2	3.5	8.4	1.7	2.6	3.4	4.1	**73.5**
.8	4.4	2.6	4.0	0.6	3.2	2.9	2.8	**72.6**
.7	3.7	2.7	3.8	0.6	2.6	3.1	2.0	**71.1**

≥17 years of age) U.S. population.

Brand Use – Continued

Brand use varied by smoker's sex, race, and age. Differences by race in part reflected increased use of mentholated cigarettes by blacks (*4,5*). Fifty-five percent of all black smokers reported using one of three brands that were available only in mentholated form (Newport, Kool, and Salem). Fifty-four percent of smokers 17–24 years of age used Marlboro, more than twice the proportion in older age groups or the entire population (Table 1). The use of Merit and Kent varied directly with increasing level of education; in comparison, the use of Newport and Pall Mall varied inversely with level of education (Table 1).

Reported by: A Anderson, Case Western Reserve Univ School of Medicine, Cleveland, Ohio. Epidemiology Br, Office on Smoking and Health, Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: Unlike market share data, the AUTS data allow analysis of brand use by sociodemographic variables or other characteristics. Overall, self-reported brand use from the AUTS is consistent with market share data for 1986 (Table 1) (*3*). Discrepancies between the sales-based and self-reported data may reflect differences in the number of cigarettes smoked by users of different brands, differences in brand use between current smokers and former smokers who had quit in 1986 before the AUTS, and errors in measurement (e.g., use by a smoker of more than one brand). The similarity in market shares between 1986 and 1989 (Table 1) (*3*) suggests that the self-reported 1986 data on brand use may also represent more recent cigarette use.

Factors that may affect smokers' use of a brand of cigarettes include cost, the "taste" of the cigarette, the perceived harmfulness of the cigarette, and the image of those who smoke a particular brand as projected through its advertising. Assessing sociodemographic differences among smokers by brand use and determining reasons for those differences may help in developing and targeting effective interventions for reducing smoking among specific population subgroups. For example, local surveys have found that the proportion of teenaged smokers who use Marlboro is substantially higher than the brand's market share (*6,7*)—a finding consistent with the AUTS data for persons aged 17–24 years. As a result, a school curriculum designed in California is being used in several states to counter the advertised image of Marlboro smokers as strong, rugged, and independent (*8*). The key component of the curriculum, a British documentary film entitled *Death in the West*, features six real cowboys in the American West who were dying from lung cancer or emphysema. Although 26.2% of white smokers used Marlboro, only 6.0% of black smokers used that brand; therefore, a health education program based on the Marlboro image may have a greater impact among whites than among blacks.

Several brands have been marketed primarily or exclusively to women (*9*); for example, Virginia Slims (used by 5.3% of female smokers) advertising promotes the image of the independent or "liberated" female smoker. However, more than one quarter of female smokers use either Marlboro (19.4%) or Winston (7.5%), which have been depicted primarily as "male brands"; some women may smoke "male brands" because of the implication of gender equality (*10*).

AUTS data show that 76% of blacks but only 23% of whites smoked mentholated brands (*5*). Increased understanding of why blacks use mentholated brands may assist in designing smoking-prevention and smoking-cessation interventions targeted to blacks.

AUTS data (*5*) also indicate that more highly educated smokers were more likely to use brands with a low-tar yield (≤15 mg per cigarette). This finding suggests that

Brand Use – Continued

this group may be more receptive to the message that the benefits of quitting substantially exceed the benefits of switching from high- to low-tar brands (*11,12*).

By tracking trends in use of brands of cigarettes, the role of cigarette advertising in smoking initiation may be more clearly understood. For example, recent advertising campaigns for Camel cigarettes featuring the "Old Joe" dromedary cartoon character may "reposition" the brand into a younger population (*13*). An increase in the use of Camel cigarettes by young persons, particularly teenagers, would suggest that the Camel advertising campaign is stimulating the recruitment of new smokers. CDC's 1989 Teenage Attitudes and Practices Survey will provide national data on use of brands of cigarettes and smokeless tobacco among persons 12–18 years of age who use such products.

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Progress in Chronic Disease Prevention

Evaluation of an Employee Smoking Policy – Pueblo, Colorado, 1989–90

In December 1988, the Colorado Department of Health and CDC were asked to help evaluate a planned worksite policy banning employee smoking for the Colorado State Hospital, a psychiatric hospital in Pueblo, Colorado. Purposes of the evaluation were to 1) determine whether implementation of the policy reduced the exposure of hospital employees to environmental tobacco smoke (ETS) in the workplace; 2) assess the acceptance of the policy among employees; and 3) assess the effect of the policy

Employee Smoking Policy — Continued

on the smoking behavior of employees who smoked. This report presents findings from employee surveys at three time periods: before, and at 3 and 12 months after policy implementation.

Before February 1, 1989 (the day the policy was implemented), employees were allowed to smoke in designated areas within the hospital. After February 1, smoking by employees was prohibited indoors; hospitalized patients were permitted to continue smoking in designated areas on patient-care wards.

Self-administered questionnaires were distributed to all 1400 hospital employees in January (before the policy change) and May 1989 and in February 1990. The questionnaire asked employees to provide information about their exposure to ETS at work. Other questions elicited attitudes and opinions about the new hospital smoking policy.

The questionnaires were analyzed as cross-sectional samples of the hospital work force. A cohort analysis was done of 73 smokers who voluntarily identified themselves on the questionnaire and responded to the two follow-up surveys; this analysis permitted assessment of individual behavioral changes. All analyses were stratified by smoking status.

"Ever smokers" were defined as persons who had smoked $\geq$100 cigarettes in their lifetimes, including both current smokers (who continued to smoke at the time of the surveys) and former smokers who did not smoke. "Never smokers" were defined as persons who had smoked $<$100 cigarettes in their lifetimes. Smokers were asked how many cigarettes they smoked during work hours and in a 24-hour day.

In January 1989, 1032 (74%) employees responded to the questionnaire; in May 1989, 762 (54%) employees responded, and in February 1990, 745 (53%) employees responded to the follow-up survey. Age, sex, and ethnicity of respondents to each survey were similar to the demographic distribution of the entire hospital workforce (Colorado State Personnel Office, unpublished data).

In January 1989, before the employee smoking ban took effect, 41.5% of employees reported working in a smoke-free work area. In May, 3 months after the ban, 72.1% reported their work area was smoke-free ($p<0.01$, chi-square test); in February 1990, 80.5% reported their work area was smoke-free. The percentage of employees reporting smoke-free worksites did not vary by smoking status.

From January 1989 to February 1990, overall employee support for the smoking ban increased from 59% to 68%, respectively ($p<0.01$, controlled for smoking status, Mantel-Haenszel chi-square test); the greatest change occurred among former smokers. Support for the ban was greatest among never smokers and least among current smokers (Table 1).

The reported prevalence of current smoking varied little during the evaluation. In January 1989, 29% of respondents were current smokers, compared with 24% in May and 25% in February 1990. Among the cohort of 73 smokers, the average daily number of cigarettes smoked at work declined from 7.7 in January 1989 to 4.2 in February 1990; during the same period, however, the number of cigarettes smoked after work increased from 8.6 to 10.3. The net average change in cigarettes smoked in a 24-hour day declined by 1.8 cigarettes, from 16.3 to 14.5.

Reported by: GS Mayo, Colorado State Hospital, Pueblo; JA Pritzl, Colorado Dept of Administration; WF Young, RE Hoffman, MD, State Epidemiologist, Colorado Dept of Health. Program Svcs Activity, Office on Smoking and Health, Center for Chronic Disease Prevention and Health Promotion; Div of Field Svcs, Epidemiology Program Office, CDC.

Employee Smoking Policy — Continued

TABLE 1. Opinions expressed by employees about worksite smoking ban before and 3 months and 12 months after implementation of the ban, by cigarette smoking status — Colorado State Hospital, 1989–90

Smoking status	January 1989				May 1989				February 1990			
	Total		Support policy		Total		Support policy		Total		Support policy	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Current*	300	(29)	60	(20)	184	(24)	39	(21)	187	(25)	45	(24)
Former†	334	(32)	234	(70)	260	(34)	211	(81)	237	(32)	194	(82)
Never§	398	(39)	317	(80)	318	(42)	272	(86)	321	(43)	269	(84)
Total	**1032**	**(100)**	**611**	**(59)**	**762**	**(100)**	**522**	**(69)**	**745**	**(100)**	**508**	**(68)**

*Smoked ≥100 cigarettes and continued to smoke at the time of the surveys.
†Smoked ≥100 cigarettes in their lifetimes but did not smoke at the time of the surveys.
§Smoked <100 cigarettes in their lifetimes.

Editorial Note: Smoke-free worksite policies decrease the exposure of nonsmokers to ETS (*1*). The American Medical Association, the American Hospital Association, and other groups have advocated smoke-free hospitals (*2,3*). However, psychiatric hospitals present special challenges to administrators attempting to prevent the exposure of employees and patients to ETS through the creation of smoke-free hospital environments. The prevalence of smoking among psychiatric patients appears to be substantially higher than among the general population (*4*), and the concept of the smoke-free psychiatric facility has not yet been widely accepted by hospital administrators and staff (*5*). For these reasons, policies that restrict smoking in psychiatric facilities have been difficult to enact. However, smoke-free policies for psychiatric hospitals should benefit patients served by these facilities in ways other than reducing risk for smoking-related disease. For example, patients who are smokers may require higher doses of therapeutic drugs than do patients who are nonsmokers (*6*), and some psychiatric patients may be at increased risk for fatal and nonfatal injuries from fire caused by cigarettes (*7*).

This evaluation indicates that employee acceptance of smoking restrictions can be sustained in a psychiatric facility, even after being in place 12 months. These findings are similar to those reported in other worksites (*8*). Because inpatients were permitted to smoke indoors, approximately 20% of employees reported exposures to ETS at the worksite after policy implementation. Additional studies of smoke-free policies that benefit both patients and staff are under way at this facility. Through a combination of employee education and cooperation of all management levels, worksite policies can be implemented with minimal conflict and enforcement difficulty (*9*).

In Colorado, only modest short-term changes in smoking behavior (e.g., fewer cigarettes smoked at work) occurred among current smokers, but these were partially offset by an increase in smoking after working hours. Long-term changes in the smoking practices of employees may produce health and economic benefits for smoking and nonsmoking employees, as well as for employers.

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Employee Smoking Policy — Continued

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Cessation of Cigarette Smoking — United States, 1989

Smoking-initiation and smoking-cessation interventions are important in reducing the prevalence of cigarette smoking in the United States. However, progress in smoking cessation has varied appreciably by smokers' age, race, sex, educational attainment, and state of residence (*1,2*). To monitor progress in smoking cessation in relation to these factors, data from the 1989 Behavioral Risk Factor Surveillance System (BRFSS) were analyzed.

In 1989, health departments from 39 states and the District of Columbia participated in the BRFSS, a monthly random-digit–dialed telephone interview survey of adults aged ≥18 years, to obtain information on selected health behaviors (*3*). Respondents were asked if they had ever smoked at least 100 cigarettes and if they currently smoked. The "quit ratio" was the percentage of ever smokers who were former smokers when interviewed. Ratios were weighted to represent the adult population of each participating state. To compare quit ratios between states, the weighted state-specific ratios were standardized for the age, race, sex, and educational attainment of the 1980 U.S. population. Quit ratios for subgroups (age, race, sex, and educational attainment) were standardized by adjusting for the other three variables.

The weighted quit ratio varied from 43% in Kentucky to 59% in Montana (median: 51%), and the standardized quit ratio from 41% in Oklahoma to 55% in Hawaii (Table 1). In general, standardized ratios were lowest in states in the Ohio River Valley and the south and highest in states in the Rocky Mountain and mid-central regions (Figure 1). The standardized quit ratio was also greater in persons >35 years of age, whites, men, and persons with high school education or more (Table 2).

Reported by: the following state BRFSS coordinators: L Eldridge, Alabama; J Contreras, Arizona; W Wright, California; M Adams, Connecticut; A Peruga, District of Columbia; S Hoecherl, Florida; J Smith, Georgia; A Villafuerte, Hawaii; J Mitten, Idaho; B Steiner, Illinois; S Joseph, Indiana; S Schoon, Iowa; K Bramblett, Kentucky; J Sheridan, Maine; A Weinstein, Maryland; L Koumjian, Massachusetts; J Thrush, Michigan; N Salem, Minnesota; J Jackson-Thompson, Missouri; M McFarland, Montana; S Spanake, Nebraska; K Zaso, L Powers, New Hampshire; L Pendley, New Mexico; J Marin, O Munshi, New York; C Washington, North Carolina; M Maetzold, North Dakota; E Capwell, Ohio; N Hann, Oklahoma; J Grant-Worley, Oregon; C Becker, Pennsylvania; R Cabral, Rhode Island; M Mace, South Carolina; S Moritz, South Dakota; D Ridings, Tennessee; J Fellows, Texas; L Post-Nilson, Utah; J Bowie, Virginia; K Tollestrup, Washington; D Porter, West Virginia; M Soref, Wisconsin. Office of Surveillance and Analysis, Div of Chronic Disease Control and Community Intervention, and Office on Smoking and Health, Center for Chronic Disease Prevention and Health Promotion, CDC.

Smoking Cessation — Continued

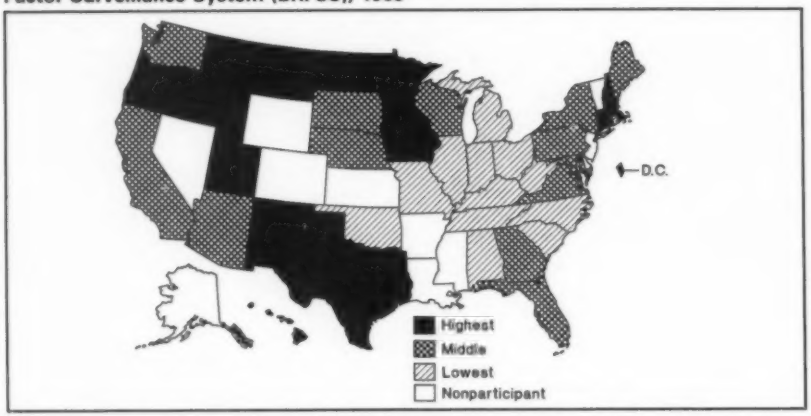
TABLE 1. Quit ratio* of ever smokers, by state† — Behavioral Risk Factor Surveillance System (BRFSS), 1989

State	No.	Weighted quit ratio			Standardized§ quit ratio		
		Rank	%	95% CI¶	Rank	%	95% CI
Alabama	695	35	45.0	±4.1	35	43.8	±4.1
Arizona	743	14	51.7	±4.2	20	47.0	±4.4
California	1017	6	55.1	±3.3	15	47.9	±3.6
Connecticut	747	12	52.8	±4.1	10	48.5	±4.3
District of Columbia	566	39	43.8	±5.0	9	48.5	±8.7
Florida	887	10	53.8	±3.6	19	47.0	±3.8
Georgia	720	28	47.9	±4.1	16	47.5	±3.9
Hawaii	390	11	52.8	±3.8	1	55.2	±5.6
Idaho	723	9	54.0	±4.1	5	52.3	±4.3
Illinois	874	27	48.5	±3.6	29	45.6	±3.6
Indiana	1068	34	45.0	±3.1	34	43.8	±3.1
Iowa	615	18	51.0	±4.5	12	48.2	±4.0
Kentucky	909	40	43.0	±3.7	39	42.1	±3.2
Maine	685	20	50.7	±3.9	18	47.3	±4.0
Maryland	758	19	50.9	±4.1	17	47.4	±4.1
Massachusetts	648	3	56.9	±4.2	4	52.3	±4.2
Michigan	1178	30	46.5	±3.2	36	43.5	±3.1
Minnesota	1674	2	57.4	±2.5	8	49.3	±2.7
Missouri	710	25	49.0	±4.1	33	44.1	±4.2
Montana	577	1	59.0	±4.3	2	54.3	±4.7
Nebraska	634	21	50.5	±4.2	26	46.0	±4.2
New Hampshire	756	5	55.3	±3.9	7	50.3	±4.2
New Mexico	567	8	54.5	±4.4	11	48.2	±4.7
New York	633	17	51.2	±4.7	25	46.0	±4.2
North Carolina	832	31	45.9	±4.0	28	45.7	±3.7
North Dakota	739	4	56.5	±3.9	3	52.7	±3.9
Ohio	694	32	45.3	±4.3	32	45.0	±3.9
Oklahoma	562	37	44.6	±4.6	40	41.2	±4.4
Oregon	855	7	55.1	±3.6	13	48.2	±4.0
Pennsylvania	917	29	47.0	±3.5	27	46.0	±3.6
Rhode Island	922	22	49.9	±3.5	30	45.5	±3.1
South Carolina	826	36	44.8	±3.8	31	45.1	±3.4
South Dakota	730	24	49.4	±3.8	22	46.6	±3.8
Tennessee	1129	38	44.0	±3.2	37	42.6	±3.1
Texas	655	16	51.3	±4.3	14	48.1	±4.7
Utah	588	15	51.5	±4.6	6	50.4	±4.6
Virginia	686	26	48.9	±4.3	23	46.3	±4.3
Washington	744	13	52.6	±3.8	21	46.9	±4.1
West Virginia	879	33	45.1	±3.9	38	42.4	±3.7
Wisconsin	656	23	49.7	±4.1	24	46.2	±4.0

*The percentage of ever smokers (those who had ever smoked ≥100 cigarettes) who were former smokers when interviewed.
†For the BRFSS, the District of Columbia is considered a state.
§Standardized for the distribution of the 1980 U.S. population by age, race, sex, and educational attainment.
¶Confidence interval.

Smoking Cessation — Continued

FIGURE 1. Smoking quit ratios* in selected states†, by tercile — Behavioral Risk Factor Surveillance System (BRFSS), 1989



*The percentage of ever smokers (those who had ever smoked ≥100 cigarettes) who were former smokers when interviewed.
†For the BRFSS, the District of Columbia is considered a state.

TABLE 2. Quit ratio* of ever smokers, by age, race, sex, and educational attainment — Behavioral Risk Factor Surveillance System, 1989

Characteristic	No.	Standardized† quit ratio %	95% CI§
Age (yrs)			
18–34¶	9,440	32.3	±1.5
35–54	11,843	43.5**	±1.5
≥55	9,905	64.5**	±1.5
Race			
Black¶	2,461	39.1	±2.8
White	28,727	47.0**	±0.9
Sex			
Female¶	16,073	43.3	±1.2
Male	15,115	49.8**	±1.2
Education (yrs)			
<12¶	5,688	36.0	±1.8
12	11,424	43.2**	±1.3
>12	14,076	55.9**	±1.3

*The percentage of ever smokers (those who had ever smoked ≥100 cigarettes) who did not smoke at the time of the survey.
†Standardized by adjusting for other sociodemographic variables in the 1980 U.S. population (e.g., age was standardized for race, sex, and educational attainment).
§Confidence interval.
¶Referent group.
**Quit ratio is significantly higher than the referent group ($p<0.05$).

Smoking Cessation — Continued

Editorial Note: The differences between states in the weighted quit ratio can be explained only in part by state-specific differences in age, race, sex, and educational attainment of the populations, since these differences persisted after standardization for differences in sociodemographic composition. Other factors affecting smoking cessation that may explain the variations in smoking cessation by state include the percentage of heavy smokers (*1*), societal norms and attitudes about smoking cessation (*1*), and the existence, strength, and scope of smoking cessation services (*4*). Restrictions on smoking also may play a role in the variations by state in smoking cessation (*1*). In general, states with the lowest quit ratios have the highest prevalence of current cigarette smoking (*2*).

Concerns about the health effects of smoking (*5*) and the occurrence of smoking-related illnesses (*6*) may contribute to the higher quit ratios for persons aged >35 years. Because continuing smokers are less likely than former smokers to survive to older ages, this differential mortality contributes to the higher quit ratios observed for older age groups (*7*). In addition, the higher quit ratios for older than for younger age groups may represent a longer opportunity to quit.

Findings in this and other reports (*8*) show that blacks were less likely than whites to be former smokers regardless of educational attainment. Limited use of established smoking cessation programs by blacks contributes to these racial differences (*9*). Nonetheless, trend data suggest that the rate of increase in the quit ratio since 1974 has been similar for whites and blacks (*1,7*).

Although men were more likely than women to be former smokers, the rate of increase in quit ratios over time has been similar for men and women (*1,7*). This finding is consistent with a diffusion phenomenon (i.e., quitting activity adopted initially by men that later diffused into the female population where it follows a pattern similar to that for men). Additionally, more men than women who quit cigarette smoking begin using cigars, pipes, or snuff or chewing tobacco (*7*). Thus, differences in smoking cessation by sex are smaller when use of other forms of tobacco are considered (*7*).

Greater difficulty in quitting among persons of low socioeconomic status may contribute to the lower quit ratios among persons with high school education or less (*1*). These and other findings suggest that smoking cessation interventions should target younger persons and persons of low socioeconomic status. In addition, such interventions should be aimed at blacks, who in general have a lower rate of smoking cessation than do whites (*10*).

Continued efforts are essential to motivate smokers to quit. Growth in tobacco-use prevention and control coalitions, which bring together a broad range of persons and organizations with the common goal of reducing the prevalence of tobacco use (*11*), will likely strengthen smoking cessation efforts by fostering a social climate that motivates smokers to quit. The American Stop Smoking Intervention Study, a planned 7-year project of the National Cancer Institute and the American Cancer Society, will substantially increase resources for tobacco control coalitions in the United States (*12*) and may accelerate progress in smoking cessation.

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Smoking Cessation — Continued

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Perspectives in Disease Prevention and Health Promotion

Smoking-Attributable Mortality — Kentucky, 1988

Smoking is the single most important preventable cause of death in the United States (*1*). Among states participating in the Behavioral Risk Factor Surveillance System (BRFSS), Kentucky has consistently ranked at or near the top in prevalence of smoking (*2*). In 1988, the BRFSS indicated that 34% of adults in Kentucky were current smokers, compared with a median prevalence of 24% for all states surveyed (*3*). To better characterize the public health burden of smoking in Kentucky, the Kentucky Department for Health Services recently estimated smoking-attributable mortality (SAM) and years of potential life lost (YPLL) in that state during 1988. This report summarizes results from that analysis.

SAM and YPLL were calculated using SAMMEC II (Smoking-Attributable Mortality, Morbidity, and Economic Costs) computer software (*4*). Calculations were made for 22 smoking-related diseases among adults aged ≥35 years (Table 1). The analysis also included smoking-related burn fatalities for persons of all ages and four perinatal conditions related to maternal smoking (*5*). Age- and sex-specific mortality data for 1988 were obtained from the state's vital records system. Age- and sex-specific smoking prevalence rates for 1988 were obtained from the state's BRFSS. YPLL were calculated to life expectancy using 1985 data from CDC's National Center for Health Statistics (*6*).

The smoking-attributable fraction (SAF) was derived from age- and sex-specific relative risks of death (based on the American Cancer Society's Cancer Prevention Study II [*1*]) and prevalence data for current and former smokers from the 1988

Smoking Mortality – Continued

TABLE 1. Estimated smoking-attributable mortality (SAM),* by cause – Kentucky, 1988

Cause of death (ICD-9-CM rubric)	Age group (yrs)	No. deaths	Crude SAF†	SAM
Neoplasms				
Lip, oral cavity, pharynx (140–149)	≥35	120	0.80	96
Esophagus (150)	≥35	102	0.79	81
Pancreas (157)	≥35	345	0.28	96
Larynx (161)	≥35	70	0.83	58
Trachea, bronchus, lung (162)	≥35	2,718	0.86	2,338
Cervix uteri (180)	≥35	101	0.31	31
Urinary bladder (188)	≥35	177	0.42	74
Kidney, other unspecified urinary organs (189)	≥35	148	0.35	52
Cardiovascular diseases				
Rheumatic heart disease (390–398)	≥35	54	0.17	9
Hypertensive disease (401–404)	≥35	396	0.19	77
Ischemic heart disease (410–414)	≥35	8,393	0.24	2,034
Pulmonary circulation disease (415–417)	≥35	249	0.21	52
Other heart disease (420–429)	≥35	3,637	0.20	734
Cerebrovascular disease (430–438)	≥35	2,546	0.19	496
Atherosclerosis (440)	≥35	430	0.41	177
Aortic aneurysm (441)	≥35	235	0.50	118
Other arterial disease (442–448)	≥35	128	0.43	55
Respiratory diseases				
Respiratory tuberculosis (010–012)	≥35	28	0.29	8
Pneumonia, influenza (480–487)	≥35	1,324	0.28	367
Chronic bronchitis, emphysema (491–492)	≥35	300	0.82	246
Asthma (493)	≥35	54	0.28	15
Chronic airway obstruction (496)	≥35	1,132	0.82	924
Perinatal conditions				
Short gestation/low birth weight (765)	<1	70	0.21	15
Respiratory distress syndrome (769)	<1	36	0.19	7
Other respiratory condition of fetus and newborn (770)	<1	27	0.22	6
Sudden infant death syndrome (798.0)	<1	121	0.15	18
Other conditions				
Burn deaths (E890–E899)	>0	105	0.45	47
All other causes	>0	14,246	0.00	0
Total	**>0**	**37,292**	**0.22**	**8,230**

*Total SAM was calculated by multiplying the number of deaths in each disease category by the specific smoking-attributable fraction (SAF). Because of rounding, SAM may not equal the product of SAF times the number of deaths.

†Derived from age- and sex-specific relative risks of death (based on the American Cancer Society's Cancer Prevention Study II [*1*]) and prevalence data for current and former smokers from the 1988 Behavioral Risk Factor Surveillance System.

Smoking Mortality — Continued

BRFSS. Total SAM was calculated by multiplying the number of deaths in each disease category by the specific SAF. Total smoking-attributable YPLL was calculated by multiplying the age-specific SAM by YPLL for each premature death.

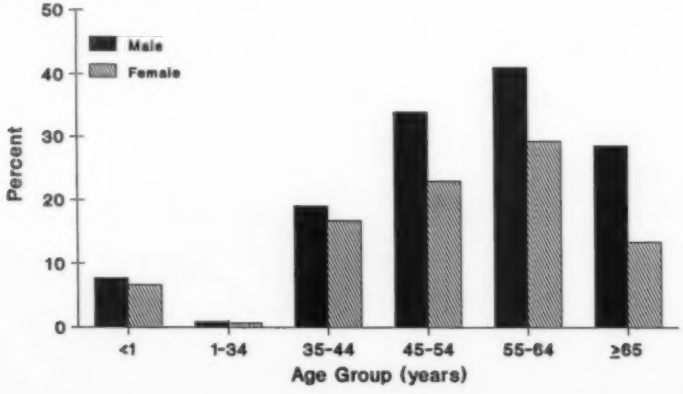
In 1988, 8230 deaths in Kentucky were attributable to smoking, accounting for 22% of all deaths in the state during the year. Fifty-three percent of smoking-attributable deaths were from lung cancer and ischemic heart disease (Table 1). Sixty-eight percent of SAM occurred among men (Table 2). Sixty-seven percent of deaths occurred in persons ≥65 years of age. However, when smoking-attributable deaths were calculated as a percentage of total deaths, persons aged 45–64 years had a higher percentage of deaths caused by smoking than did persons aged ≥65 years (Figure 1). For men aged 55–64 years, 41% of all deaths were attributable to smoking. When considered as a separate cause of death, SAM was the most common cause of death in men, the third most common cause in women, and, for both sexes, the second most common cause in Kentucky (Table 2).

TABLE 2. Deaths from selected causes, including smoking, by sex — Kentucky, 1988

	Male		Female		Total	
Underlying cause of death	**No.**	**(%)**	**No.**	**(%)**	**No.**	**(%)**
Diseases of the heart*	4,950	(25.1)	5,305	(30.2)	**10,255**	**(27.5)**
Smoking-attributable mortality	5,589	(28.4)	2,642	(15.0)	**8,230**	**(22.1)**
Malignant neoplasms*	2,665	(13.5)	2,950	(16.8)	**5,615**	**(15.1)**
Cerebrovascular diseases*	746	(3.8)	1,404	(8.0)	**2,150**	**(5.8)**
Unintentional injuries*	1,201	(6.1)	552	(3.1)	**1,753**	**(4.7)**
Influenza and pneumonia*	431	(2.2)	581	(3.3)	**1,012**	**(2.7)**
All other causes*	4,132	(21.0)	4,144	(23.6)	**8,276**	**(22.2)**
Total	**19,714**	**(100.0)**	**17,578**	**(100.0)**	**37,292**	**(100.0)**

*Excludes smoking-attributable deaths.

FIGURE 1. Smoking-attributable deaths as a percentage of total deaths, by age and sex — Kentucky, 1988



Smoking Mortality — Continued

In 1988, 115,458 YPLL before life expectancy in Kentucky were attributable to smoking. Fifty-five percent of smoking-attributable YPLL occurred in persons aged <65 years. The mean YPLL was 14 years per smoking-attributable death.

Reported by: R Finger, MD, State Epidemiologist, Dept for Health Svcs, Kentucky Cabinet for Human Resources. JM Shultz, PhD, Dept of Epidemiology and Public Health, Univ of Miami School of Medicine, Miami, Florida. Program Svcs Activity, Office on Smoking and Health, Center for Chronic Disease Prevention and Health Promotion; Div of Field Svcs, Epidemiology Program Office, CDC.

Editorial Note: This analysis quantifies the premature mortality caused by smoking in a state with a historically high prevalence of tobacco use. The high prevalence of smoking among middle-aged persons in Kentucky (38.4% among those aged 35–49 years and 34.9% among those aged 50–64 years) (*2*) is of special concern. The data indicate a need to intensify cessation efforts among these persons before the onset of chronic diseases associated with smoking. *The Health Benefits of Smoking Cessation: A Report of the Surgeon General, 1990,* describes the important reductions in risk that may be associated with smoking cessation at any age (*7*).

To reduce the burden of SAM in Kentucky, greater efforts are also necessary to prevent smoking among young persons. During the 1990 legislative session in Kentucky, the legislature enacted a law prohibiting the sale of tobacco products to all persons <16 years of age. This law also established fines for vendors who sell tobacco products to persons aged <16 years and requires that signs stating the age limit for purchase of tobacco be posted at the point of sale. Enforcement of laws such as this is critical to reducing tobacco use (*8*).

SAMMEC II software can be used to estimate the effects of smoking and has been distributed to all 50 states and the District of Columbia. Additional state-specific estimates may be made using this software to provide public health workers and policymakers with important updated information regarding the impact of smoking in their respective states (*9*).

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